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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,858	03/24/2004	Michael B. Korzenski	020732-110.694	5492
24239	7590	10/12/2007		
MOORE & VAN ALLEN PLLC P.O. BOX 13706 Research Triangle Park, NC 27709			EXAMINER AHMED, SHAMIM	
			ART UNIT 1792	PAPER NUMBER
			MAIL DATE 10/12/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/807,858	<b>Applicant(s)</b> KORZENSKI ET AL.	
	<b>Examiner</b> Shamim Ahmed	<b>Art Unit</b> 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 03 August 2007.  
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.  
 4a) Of the above claim(s) 1-14 is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 15-37 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) ☐ All b) ☐ Some \* c) ☐ None of:  
 1. ☐ Certified copies of the priority documents have been received.  
 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
 \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed 8/3/07 have been fully considered but they are not persuasive. Applicants argue that operating temperature is in the range of 50 to 90 degree C. Applicants also pointed out that Sehgal does not teach the use of a supercritical fluid at 80 degree C as of paragraph 0058 as examiner noted in the previous office action.

In response, examiner states that Sehgal teaches the temperature of the super critical fluid will be much higher than critical temperature of 31 degree C (paragraph 0010) and in a preferred embodiment the temperature can be 110 degree C (see at least paragraphs 0075-0076).

Sehgal also teach that super critical fluid process condition of photoresist stripping compared to processing in ambient pressure such as is the higher temperature about 100 degree C and pressure of 2400 psi will accelerate the stripping of photoresist (paragraph 0058) and one skilled in the art would have been motivated to do so for accelerating the stripping rate.

Therefore, Sehgal teaches the temperature in the super critical processing can be maintain between 31 degree C to 110 degree C, which is overlapping the claimed range of 50-90 degree C and it has been held that where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191USPQ 90 (CCPA 1976); see also MPEP 2144.05 [R-5].

Applicants also argue that Sehgal teaches the composition includes hydrogen peroxide and the presence of hydrogen peroxide will materially affect the basic and novel characteristics of the claimed invention.

In response to the argument, examiner states that the argument is not persuasive because the "consisting essentially of" is not a closed language and the presence of hydrogen peroxide into the photoresist stripping composition of Sehgal does not destroy or does not make the photoresist stripping solution inactive or in operable.

Additionally, as applicant acknowledged at page 12 of the response filed 8/3/07 that Sehgal's composition optionally (emphasis added) includes an oxidizer (such as hydrogen peroxide).

Therefore, Sehgal's composition reads on the claimed composition.

As to the 112, first paragraph, applicant's argument/comments are persuasive to overcome the rejection.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 15-23,25-27,30,35 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sehgal (US 2004/0050406 A1).

Sehgal teaches a process for removing photoresist or BARC using a composition in which the composition comprises supercritical fluid (SCF) of carbon dioxide, co solvent such as isopropanol (paragraphs 0017,0028-0029 and 0069) and hydrogen peroxide (paragraph 0043).

Sehgal teaches that the composition may include ammonium fluoride (paragraph 0048), wherein the oxidizer or the ammonium fluoride may work as the claimed etchant.

Sehgal teaches the composition may include surfactant, which may be anionic, cationic or non-ionic (see paragraphs 0045 and 0060).

Sehgal also teaches the composition may include accelerator to the co-solvent mixture such as sulfuric acid (paragraph 0053).

Sehgal teaches the temperature of the super critical fluid will be much higher than critical temperature of 31 degree C (paragraph 0010) and that could be 55 degree C as explained in example 1 (paragraph 0074).

Sehgal also teaches the higher temperature (about 80 degree) and pressure will accelerate the stripping of photoresist using the supercritical fluid (paragraph 0058).

Therefore, it would have been obvious to one of ordinary skilled in the art would have been motivated to do so for accelerating the stripping rate.

As to claim 37, Sehgal teaches the use of isopropyl amine in the composition including SCF (see claim 21).

4. Claims 24,28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sehgal (US 2004/0050406 A1) as applied to claims 15-23,25-27,30 and 35 above, and further in view of De Young et al (6,669,785).

As to claim 24, Sehgal discloses above in the paragraph 3 but fail to teach the etchant could comprises triethylamine trihydrofluoride.

However, De Young et al disclose a composition for removing photoresist/antireflective coating with additives such as hydrogen fluoride or triethylamine trihydrofluoride (col.2, lines 26-41 and col.4, lines 43-65).

As to claims 28-30, since the photoresist and the BARC material is removing, it would have been obvious to have residual amount of the above materials present in the removing solution.

5. Claims 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sehgal (US 2004/0050406 A1) as applied to claims 15-23,25-27,30 above, and further in view of Xu et al (US 2003/0125225).

Sehgal discloses above in the paragraph 3 but fail to teach the repetitive carrying out the dynamic flow contacting and static soaking contacting the substrate to be cleaned.

However, Xu et al teach a cleaning/removal process of unwanted residue including unexposed photoresist using supercritical fluid composition as claimed including the steps of contacting the fluid to the substrate by flowing and repeated cycles of soaking to achieve substantially complete removal of the unwanted materials from the substrate (paragraphs 0059-0061).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to employ Xu et al's teaching into Sehgal's process for complete removal of the residual material in order to have a cleaned surface as taught by Xu et al.

6. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sehgal (US 2004/0050406 A1) as applied to claims 15-23,25-27,30 above, and further in view of Hess et al (6,627,588).

Sehgal discloses above in the paragraph 3 but fail to teach the removal process involve the removal of ion implanted photoresist.

However, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to remove the ion-implanted photoresist as Hess et al teach the conventional removal of photoresist and ion implanted photoresist using isopropanol (abstract and col.1, lines 50-61).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to employ Hess et al's teaching into Sehgal's process for

efficient cleaning of the ion implanted photoresist as well as the photoresist in order to have cleaner surface to work with in the subsequent processing.

In the above, examiner assuming the implanted ion came from the ion-implantation of the substrate prior to the removal process.

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

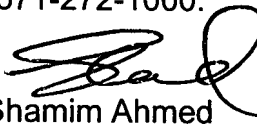
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on Tu-Fri (12:30-10:30) Every Monday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone



number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Shamim Ahmed  
Primary Examiner  
Art Unit 1792

SA  
October 9, 2007